

### **REMARKS**

This is a full and timely response to the Office Action mailed January 31, 2011, filed concurrently with a Request for Continued Examination.

By this Amendment, claim 1 has been amended to more particularly define the present invention. Thus, claims 1 and 3-12, are currently pending in this application, with claims 3, 4, 6, 7, 11, and 12 being withdrawn. Support for the claim amendments can be readily found variously throughout the specification and the original claims. No new matter has been added.

In view of these amendments, Applicant believes that all pending claims are in condition for allowance. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

### **Rejection under 35 U.S.C. §103**

Claims 1, 5, and 8-10 remain rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Wakayama et al. (U.S. Patent Application Publication No. 2004/0154456). Applicant respectfully traverses this rejection.

To establish an obviousness rejection under 35 U.S.C. §103(a), four factual inquiries must be examined. The four factual inquiries include (a) determining the scope and contents of the prior art; (b) ascertaining the differences between the prior art and the claims in issue; (c) resolving the level of ordinary skill in the pertinent art; and (d) evaluating evidence of secondary consideration. *Graham v. John Deere*, 383 U.S. 1, 17-18 (1966). In view of these four factors, the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and should "identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. *KSR Int'l. Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 82 USPQ2d 1385, 1396 (2007). Further, the Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). Finally, even if the prior art may be combined, there must be a reasonable expectation of success, and the reference or

references, when combined, must disclose or suggest all of the claim limitations. *See in re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Here, in this case, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness because Wakayama et al. fails to disclose or suggest all of the claim limitations with particular emphasis on the limitations, "*wherein, in the formation of said at least one scribe line in the second direction, the scribe means stops scribing at a scribe stop position which is set at a distance of 0.5 to 0.7 mm from said scribe line in the first direction and restarts scribing at a scribe re-start position which is set at a distance of 0.5 to 0.7 mm from said scribe line in the first direction,*" and "*wherein the second high-penetration vertical crack extends beyond the scribe stop position and reaches the scribe line in the first direction, and also extends backward from the scribe re-start position and reaches the scribe line in the first direction, thereby forming the intersection between the scribe line in the second direction and the scribe line in the first direction.*"

In the present invention, the formation of the intersection between the scribe line in the second direction and the scribe line of the first direction occurs without the scribe means being pressed against an existing scribe line in the brittle material substrate. The Examiner asserts that the phrase "*crosses an existing scribe line*" cannot be considered to differentiate the prior art and the present invention since both deal with scribing operations wherein a new scribe line is formed when the scribing head crosses an existing scribe line (see page 5 of the Office Action). However, the Examiner has apparently misunderstood Applicant's argument. Applicant did not argue that the prior art fails to teach or suggest *crossing an existing scribe line*. Rather, Applicant argued that the scribing head of Wakayama et al. is pressed against the existing scribe line during formation of an intersecting scribe line whereas the scribing head of the present invention is not pressed against the existing scribe line during formation of an intersecting scribe line. Thus, Wakayama et al. differs from the present invention.

The Examiner also argues that Figure 13 of Wakayama et al. does not support Applicant's assertion that the scribing head falls down into the crevice of the existing scribe line and then bounces when it hits the far wall of the crevice. More specifically, the Examiner asserts that Figure 13 does not show a crevice and that the wheel 95 prevents a jump from occurring (see page 5

of the Office Action). Applicant strongly disagrees with the Examiner's position. Figure 13 of Wakayama et al. clearly shows that a portion of the wheel 95 falls below the glass surface GL at a break or crevice in the glass surface GL that is formed by an existing scribe line. Also, when the wheel 95 is in this crevice, the wheel 95 contacts the edges of the glass surface GL defining the crevice (see also paragraphs [0021]-[0024] and [0046] of Wakayama et al.). The second crevice wall of the glass surface GL acts as a vertical barrier impeding the progress of the wheel 95, forcing the wheel 95 to "bounce" to overcome it.

Further, while Wakayama et al. discloses that the turning moment which causes a bounce of the cutter wheel tip 95 can be avoided by appropriate adjustment of the scribe speed and the relative position of the cutter wheel tip 95 and the support shaft 99 (see paragraph [0120] of Wakayama et al.), Wakayama et al. does not disclose stopping the application of pressure to the wheel tip 95 altogether as the wheel rolls across crevice. Thus, Wakayama et al. does not teach *"wherein the formation of the intersection between the scribe line in the second direction and the scribe line of the first direction occurs without the scribe means being pressed against an existing scribe line in the brittle material substrate."*

The Examiner also argues that it is clear from Figure 21 that the scribing wheel of Wakayama et al. jumps prior to crossing the existing scribe line and lands after crossing the existing scribe line (see pages 5-6 of the Office Action). The Examiner also cites paragraph [0013] of Wakayama et al., which discloses, *"even if a scribing force toward the glass plate surface is applied by the scribing head, this scribing force is cancelled when the cutter wheel tip crosses and passes existing scribe lines, by latent internal stresses on both side of these scribe lines,"* to support this assertion (see page 6 of the Office Action). Figure 21 of Wakayama et al. is an illustrative description of a phenomenon of skipping intersections (see paragraph [0070] of Wakayama et al.). However, it is not explained in Wakayama et al. how or why the scribing wheel of Wakayama et al. could jump prior to reaching an existing scribe line. In other words, until the scribing wheel of Wakayama et al. reaches a second wall of a crevice in the glass surface GL formed by an existing scribe line, there is no vertical barrier or other impetus that would cause the scribing wheel to jump. Thus, the disclosure of Wakayama et al. provides no support for the Examiner's interpretation of Figure 21 of Wakayama et al.

The Examiner goes on to states that, “*While bounces may occur unexpectedly, Wakayama et al. clearly teaches that such bounces occur during the crossing an existing scribe line, particularly in the prior art devices disclosed therein*” (see page 6 of the Office Action). Once again the Examiner appears to have misunderstood Applicant's argument. As noted in the previous response, the cutter wheel of Wakayama et al. is caused to bounce up when or after the scribing head crosses existing scribe lines of a first direction. Thus, while bounces only occur when the scribing head is in the vicinity of an existing scribe line (i.e., when the scribing head is in contact with a portion of a crevice wall), the exact position of the scribing head with regard to the crevice of the existing scribe line when a bounce occurs may vary (i.e., the scribing head could bounce off the first crevice wall and/or the second crevice wall). However, in contrast to the present invention, Wakayama et al. does not disclose that the scribing (pressing) action is suspended from shortly before until shortly after the scribing head crosses existing scribe lines of a first direction. Further, Wakayama et al. also does not disclose that in the formation of at least one scribe line in a second direction, the scribe means presses against the brittle material substrate at a scribe start position and a scribe stop position which are set at a distance of 0.5 to 0.7 mm from the scribe line of the first direction.

Lastly, the Examiner argues that while Wakayama et al. does not address the same problem as Applicant's invention, it does teach or suggest all the steps of the present claims (see page 6 of the Office Action). However, as previously noted, Wakayama et al. discusses a problem in the prior art in which a scribing head bounces when crossing an existing scribe line. The bounce occurs because the scribing head falls down into the crevice of the existing scribe line and then bounces when it hits the far wall of the crevice (see Figure 13 of Wakayama et al.). Wakayama et al. aims to solve this problem by raising (i.e. increasing) the scribe pressure temporarily when the scribing head passes an existing scribe line (see paragraph [0034] and [0089] of Wakayama et al.). This arrangement can prevent the cutter wheel tip from jumping up when it crosses a raised scribe trace formed in a previous scribing action. This is an effective measure against “skipping of intersections” (see paragraph [0035] of Wakayama et al.). Thus, Wakayama et al. attempts to avoid the skipping of an intersection by increasing the pressure applied to the cutter wheel tip. This is the complete opposite of the present invention in which an intersection is purposely skipped by

temporarily eliminating the application of pressure to the scribe means. Further, as noted above, Wakayama et al. also does not disclose that in the formation of at least one scribe line in a second direction, the scribe means presses against the brittle material substrate at a scribe start position and a scribe stop position which are set at a distance of 0.5 to 0.7 mm from the scribe line of the first direction. In other words, in the formation of at least one scribe line in the second direction, the scribe means stops scribing at a scribe stop position which is set at a distance of 0.5 to 0.7 mm from said scribe line in the first direction and restarts scribing at a scribe re-start position which is set at a distance of 0.5 to 0.7 mm from said scribe line in the first direction.

Hence, Applicant disagrees that Wakayama et al. teaches and/or suggests a method in which every step of the claimed invention is performed.

Still, since it is clear that the Examiner has not interpreted the claims in accordance with Applicant's intended meaning, Applicant has amended claim 1 to more particularly define the limitation of *"wherein the formation of the intersection between the scribe line in the second direction and the scribe line of the first direction occurs without the scribe means being pressed against an existing scribe line in the brittle material substrate"* by replacing said limitation with the following limitations *"wherein, in the formation of said at least one scribe line in the second direction, the scribe means stops scribing at a scribe stop position which is set at a distance of 0.5 to 0.7 mm from said scribe line in the first direction and restarts scribing at a scribe re-start position which is set at a distance of 0.5 to 0.7 mm from said scribe line in the first direction,"* and *"wherein the second high-penetration vertical crack extends beyond the scribe stop position and reaches the scribe line in the first direction, and also extends backward from the scribe re-start position and reaches the scribe line in the first direction, thereby forming the intersection between the scribe line in the second direction and the scribe line in the first direction."* Applicant believes that the newly added claim limitations more particularly describe the scribe means not running across, but jumping over, an existing scribe line, and the vertical crack extends by itself from the scribe stop position and the scribe re-start position and reaches the existing scribe line, thereby forming an intersection. Applicant submits that Wakayama et al. clearly fails to teach or suggest such features (i.e. *limitations*) of amended claim 1.

In view of the above, Applicant respectfully submits that claim 1 is allowable over Wakayama et al. Further, claims 5 and 8-10 depend directly or indirectly from amended claim 1, and include all of the features of amended claim 1. Thus, in view of such dependencies, Applicant also respectfully submits that the dependent claims are allowable at least for the reasons that claim 1 is allowable as well as for the features they recite.

Thus, for these reasons, withdrawal of the present rejection is respectfully requested.

**CONCLUSION**

For the foregoing reasons, all the claims now pending in the present application are believed to be clearly patentable over the outstanding rejections. Accordingly, favorable reconsideration of the claims in light of the above remarks is courteously solicited. If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

Dated: May 2, 2011

Respectfully submitted,

By: 

Lee Cheng

Registration No.: 40,949  
CHENG LAW GROUP, PLLC  
1100 17th Street, N.W.  
Suite 503  
Washington, DC 20036  
(202) 530-1280  
Attorney for Applicant

Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 50-4422 for any such fees; and Applicant(s) hereby petition for any needed extension of time.